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MAY 05 2009

PAYETTE NF
SUPERVISOR'S OFFICE



Suzanne Rainville
Forest Supervisor
Payette National Forest
800 W. Lakeside Drive
McCall, Idaho 83638

MAY 01 2009

Subject: Warren Wagon Road Improvement Project—Idaho County, Idaho—Biological
Opinion
113.0000 14420-2009-F-0223

Dear Ms. Rainville:

This letter transmits the Fish and Wildlife Service's (Service) Biological Opinion (Opinion) on the effects of the Warren Wagon Road Improvement Project on the Payette National Forest (Forest) to species listed under the Endangered Species Act (Act) of 1973, as amended. In a letter dated March 4, 2009, and received by the Service on March 5, the Forest requested formal consultation on the determination under section 7 of the Act that the proposed project will result in adverse effects to bull trout (*Salvelinus confluentus*).

The enclosed Opinion is based primarily on our review of the proposed action as described in your March 2009 Biological Assessment (Assessment) regarding the effects of the road improvement actions on the bull trout and was prepared in accordance with section 7 of the Act. Our Opinion concludes that the proposed project will not jeopardize the survival and recovery of bull trout populations.

A complete record of this consultation is on file at this office. Thank you for your continued interest in the conservation of threatened and endangered species. Please contact Allyson Turner at (208) 685-6952 if you have questions concerning this Opinion.

Sincerely,

Sandra K. Brewer

JL

Jeffery L. Foss, State Supervisor
Idaho Fish and Wildlife Office

Enclosure

cc: NOAA Fisheries, Boise (Edwards)

TAKE PRIDE
IN AMERICA 

BIOLOGICAL OPINION

**WARREN WAGON ROAD IMPROVEMENT PROJECT
PAYETTE NATIONAL FOREST**

14420-2009-0223

**MAY 2009
FISH AND WILDLIFE SERVICE
IDAHO FISH AND WILDLIFE OFFICE
BOISE, IDAHO**

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INTRODUCTION

The Fish and Wildlife Service (Service) has prepared this Biological Opinion (Opinion) in response to the Payette National Forest's (Forest) request for formal consultation on the effects to bull trout (*Salvelinus confluentus*) from the proposed Warren Wagon Road Improvement Project (Project). The Forest determined that the Project will likely result in adverse effects to bull trout. Based on the analysis presented in the Biological Assessment (Assessment), the Service concludes that the Project will not jeopardize the survival and recovery of the coterminous population of bull trout.

CONSULTATION HISTORY

The Forest and the Service have had the following meetings and correspondence concerning the proposed road improvement project.

January 4, 2007	The Service received a draft biological assessment for the Project.
November 16, 2007	The Project was discussed with the Service at a Forest Level 1 Team meeting.
May 4, 2008	A second draft assessment for the Project was received by the Service.
March 5, 2009	A final biological assessment for the subject project was received by the Service.

BIOLOGICAL OPINION

I. DESCRIPTION OF PROPOSED ACTION

A. Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The action area addressed in this consultation is located about 18 miles northeast of McCall, Idaho on the McCall Ranger District of the Forest (Figure 1). It is located along and adjacent to a 2.1-mile section of Warren Wagon Road (Forest Highway 21) in Idaho County. The legal description of the area is T22N, R5E, Sections 4, 7, 8, and 9. The Secesh River parallels the southern side of Forest Highway 21 and the road segments in the project area correspond with river miles 0.71 to 2.63. The Secesh River is a major tributary to the South Fork Salmon River.

B. Proposed Action

The Forest is proposing to widen and improve five segments of the existing road alignment along an approximately 2.1-mile section of Warren Wagon Road. The Proposed Action would widen and remove materials on the cut slopes of these five road segments for greater traffic safety in narrow, restricted locations. The segments would begin 0.8 miles east of Burgdorf Junction and would be interspersed along the next 2.1 miles of Warren Wagon Road (Figure 2). The five

Figure 1. Warren Wagon Road Improvement Project Location Map.

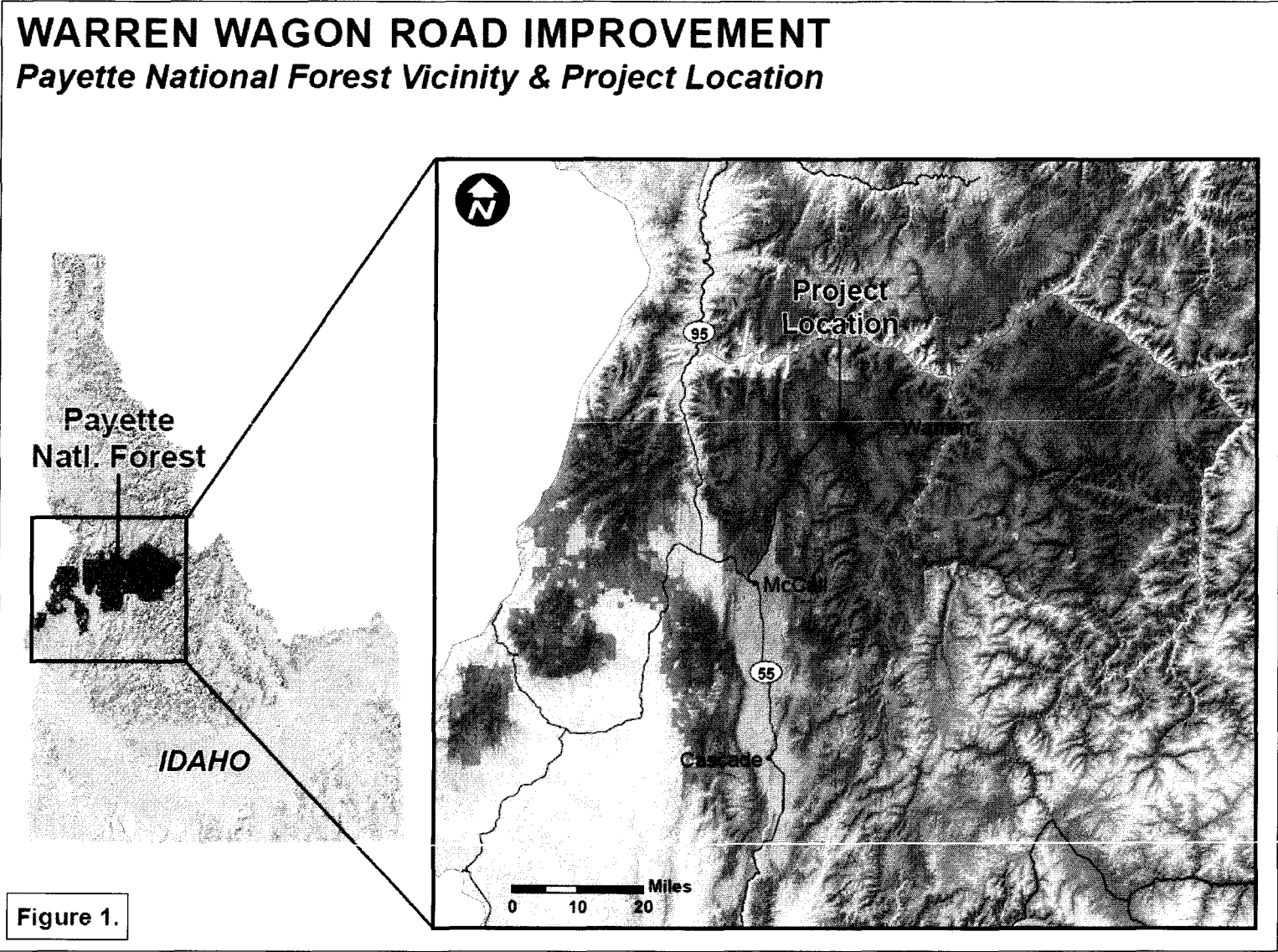
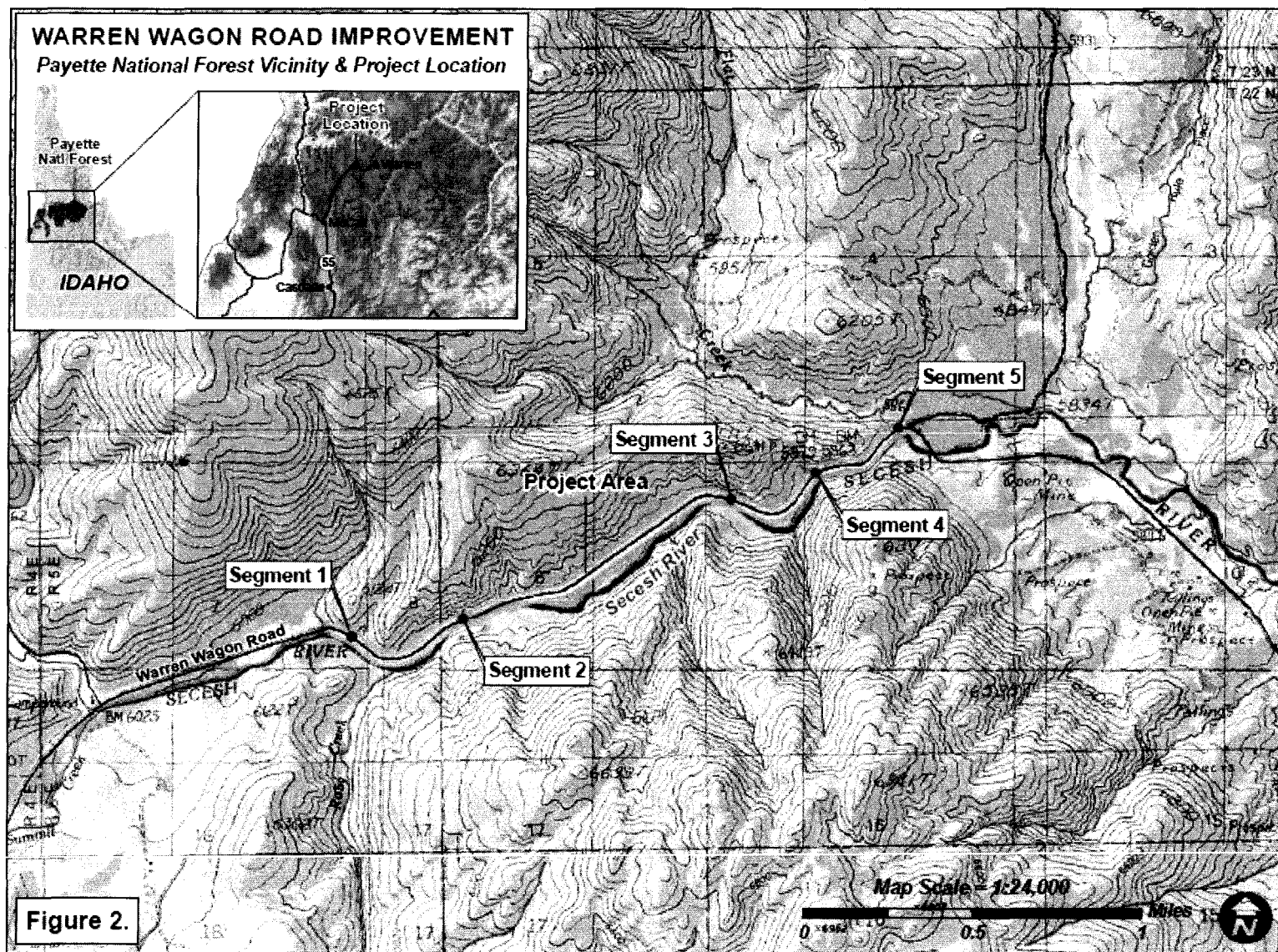


Figure 2. Location of the Five Proposed Segments for the Warren Wagon Road Improvement Project.



segments would have differing lengths and requirements to meet the purpose of the project but would not exceed 0.25 miles in overall construction length (Table 1). The existing roadway at each segment would be widened to increase the road prism to a uniform width of 24 to 26 feet. A catchment ditch on the upland shoulder would be included as part of the road prism, would not exceed two feet, and would be graveled to decrease erosion potential from hardening of the road surface. The existing Jersey barriers along the streamside road shoulder would be repositioned two to four feet towards the inside of the road in Segment 1, 2 and 3 and remain in place in Segments 4 and 5. Heavy equipment and blasting (Segments 1 and 2) would be used to loosen and remove the fill. Tree felling would be required to facilitate removal of fill.

Table 1. Road segment features for the proposed Warren Wagon Road Improvement Project.

Segment	Location	Length of Segment	Fill Removal (cubic yards)	Slope Configuration
1	0.8 miles	370 feet	3,200 maximum	0.5: 1 to vertical:angle of repose
2	1.2 miles	250 feet	2,400 maximum	0.5:1 to vertical:angle of repose
3	2.1 miles	250 feet	250	0.5: 1 to vertical
4	2.5 miles	240 feet	170	0.5: 1 to vertical
5	2.9 miles	260 feet	-250	Fill area

The five road segments would commit a maximum of 0.6 acres of soil to road prism and expose less than 1.5 acres of hillside to erosion from disturbed cut and fill. Construction on the project is proposed to start in the fall of 2009 and be completed by the fall of 2011. The Forest noted in the Assessment that the size of the project is small and the number and type of vehicles would be minimal (2 to 3 trucks and 2 to 3 large pieces of equipment including loader, backhoe, and grader). The duration of construction is short in time which would include 1 to 2 weeks per segment for the complete duration (preparation work, construction, and final grade and cleanup) and 3 to 4 days for the major portion of road widening construction.

1. Segment 1

Segment 1 is 370 feet in length including the approaches which are 20 feet on either side. This segment is the longest of the five segments and is broken down into four sections of approaches, three cross sections or cut slope areas, and two intervals between the cross sections. Specific features of Segment 1 are listed below:

- A cut slope of 0.5:1 to vertical along 220 feet of the roadway widening (maximum of 3,200 cubic yards of removal from the cut slope) is proposed. The maximum fill removal would account for that which may be needed to meet the angle of repose if solid rock is not encountered. Revegetation activities would be implemented to stabilize the slopes and reduce a long-term source of erosion.

- This portion of the road would be widened from the existing eight to 12 feet to 24 to 26 feet overall width.
- Two 15 inch diameter functioning drainage culverts would be extended to meet the new road width. If damage to the culverts is observed, they will be replaced with 18-inch culverts.
- The exiting Jersey barriers in the first section of Segment 1 are stable and four to six feet from the river. These would remain in place and continue to reduce sediment movement, minimize sidecasting, and provide a barrier for escaped vehicles. There are five Jersey barriers that are unstable in the second K-rail section of the segment. These would be realigned with the remaining section and stabilized with materials (larger boulders) from the cut areas, as available. This would move them approximately two to four feet further away from the streambank.
- Blasting for removal is not expected in Segment 1. However, if blasting is required, guidelines outlined in Table 2 and the project design features (Assessment, p 20-30) would be followed. This includes distance from the stream, size of the blasts, timing of the blasts, and mitigation to reduce noise-related impacts to fish and wildlife.
- The following buffer restrictions, which apply to single shots of a given weight of explosive or single shots in a multiple charge if each shot is separated by an eight millisecond or longer delay, would be followed during construction blasting activities.

Table 2. Proposed Blasting Distances and Charge Weights.

Explosive Charge Weight* (pounds)	Distance from stream necessary to protect fish from swimbladder effects and egg disturbance (feet)
0.5	30
1.0	50
2.0	80
5.0	120

*These restrictions have been determined to protect fish from both swimbladder effects and egg disturbances and have been approved in programmatic consultation for road maintenance projects in Idaho National Forests, including the PNF (Stream Crossing Programmatic, Reference #2006-F-0206).

- An estimated 14 to 18 trees (lodgepole pine and alpine fir) ranging in diameter from four inches to 16 inches diameter at breast height (DBH) would be removed and stored on site (within the road right-of-way or placed upslope in the project area outside of the cut slope areas) and where appropriate (as designated by the project contract manager) repositioned on the exposed cut slopes or moved to other locations in the project area to reduce soil movement and promote the establishment of vegetation.

2. Segment 2

Segment 2 is 250 feet in length including the approaches of 40 feet, one cross section or cut slope, and two intervals between approaches and the steep cut slope. Specific features of Segment 2 are listed below:

- A cut slope of 0.5:1 to vertical along 140 feet of the roadway widening will be created (maximum of 2,200 cubic yards of removal from the cut slope). The maximum fill removal would account for that which may be needed to meet the angle of repose if solid rock is not encountered as indicated in the preliminary design phase. Revegetation activities would be implemented to stabilize the slopes and reduce a long-term source of erosion.
- This portion of the road would be widened from the existing 10 to 14 feet to 24 to 26 feet of overall width.
- Two 15-inch diameter drainage culverts would be extended to meet the new road width (23 and 25 feet extended to 38 feet). If damage to the culverts is observed, they will be replaced with 18-inch culverts.
- There are five Jersey barriers which are unstable and would be re-aligned with the existing rails and moved approximately two to four feet from the river.
- Blasting for removal would occur but is expected to be minimal in Segment 2. Blasting would follow the guidelines outlined in Table 2 and the project design features (Assessment, pp 20-30). This includes appropriate distance from the stream, size of the blasts, timing of the blasts, and design features to reduce noise related impacts to fish and wildlife.
- An estimated 18 to 20 trees (lodgepole pine and alpine fir) ranging in diameters from four to 18 inches DBH would be removed and stored on site and where appropriate (as designated by the project contract manager) repositioned on the exposed cut slopes or moved to other locations in the project area to reduce soil movement and promote the establishment of vegetation.

3. Segment 3

Segment 3 is 250 feet in length including the approaches, cut slope, and an interval area. Specific features of Segment 3 are listed below:

- A cut slope of 0.5:1 to vertical along 180 feet of the roadway widening (250 cubic yards) will be created in this segment.
- This portion of the road would be widened from the existing 12 to 16 feet to 24 to 26 feet of overall width.
- No drainage culverts exist in Segment 3.

- There are six Jersey barriers which are unstable and would be re-positioned approximately two to four feet away from the streambank where they would be stabilized.
- No blasting would occur in Segment 3.
- Only two saplings and four to five seedlings (alpine fir) less than four inches DBH would be cut. This site burned in the Burgdorf 2000 fire and has very few standing trees. These trees would be lopped and scattered upslope from the roadway.

4. Segment 4

Segment 4 is 240 feet in length including the approaches and a cut slope area. Specific features of Segment 4 are listed below:

- A cut slope of 0.5:1 to vertical along 200 feet of the roadway widening (170 cubic yards) will be created in this segment.
- This portion of the road would be widened from the existing 14 to 18 feet to 24 to 26 feet of overall width.
- One 15-inch diameter drainage culvert would be extended to meet the new road width (25 feet extended to 40 feet). If damage to the culvert is observed, it will be replaced with an 18-inch culvert.
- The Jersey barriers in this segment are stable and away from the streambank by eight to 12 feet and would not be moved.
- No blasting would occur in Segment 4.
- An estimated 18 to 20 trees (lodgepole pine and alpine fir) ranging in diameters from four to 20 inches DBH would be cut. Many of these trees were burned in the 2007 East Zone Complex fires. These trees would be lopped and scattered upslope from the roadway or moved to other portions of the project area where they would be used to retain soil stability.

5. Segment 5

Segment 5 is 260 feet in length including the approaches. Specific features of Segment 5 are listed below:

- This area will require approximately 250 cubic yards of fill to accommodate the new road width; no new hillsides or cuts are proposed.
- This portion of the road would be widened from the existing 14 to 18 feet to 24 to 26 feet of overall width.

- One 15-inch diameter drainage culvert (box culvert) would be extended to meet the new road width (36 feet extended to 48 feet). If damage to the culvert is observed, it will be replaced with an 18-inch culvert.
- The Jersey barriers in this segment are stable and away from the streambank by 10 to 15 feet and would not be moved.
- No blasting would occur in Segment 5.
- An estimated 14 to 18 trees (lodgepole pine and alpine fir) ranging in diameters from four to 20 inches DBH would be removed. These trees would be removed or lopped and scattered upslope from the roadway or moved to other portions of the project area where they would be used to retain soil stability.

The Assessment also lists extensive project design features and best management practices which are included as part of the proposed action (Assessment, pp 20-30).

II. STATUS OF THE SPECIES

A. Listing Status

The coterminous United States population of the bull trout was listed as threatened on November 1, 1999 (64 FR 58910). The threatened bull trout occurs in the Klamath River Basin of south-central Oregon, the Jarbidge River in Nevada, north to various coastal rivers of Washington to the Puget Sound, east throughout major rivers within the Columbia River Basin to the St. Mary-Belly River, and east of the Continental Divide in northwestern Montana (Cavender 1978, p. 165-166; Bond 1992, p. 4; Brewin and Brewin 1997, pp. 209-216; Leary and Allendorf 1997, p. 715-720).

The bull trout was initially listed as three Distinct Population Segments (DPSs) (63 FR 31647, 64 FR 17110). The preamble to the final listing rule for the United States coterminous population of the bull trout discusses the consolidation of these DPSs, plus two other population segments, into one listed taxon and the application of the jeopardy standard under section 7 of the Act relative to this species (64 FR 58930):

“Although this rule consolidates the five bull trout DPSs into one listed taxon, based on conformance with the DPS policy for purposes of consultation under section 7 of the Act, we intend to retain recognition of each DPS in light of available scientific information relating to their uniqueness and significance. Under this approach, these DPSs will be treated as interim recovery units with respect to application of the jeopardy standard until an approved recovery plan is developed. Formal establishment of bull trout recovery units will occur during the recovery planning process.”

Please note that consideration of the above recovery units for purposes of the jeopardy analysis is done within the context of making the jeopardy determination at the scale of the entire listed species in accordance with Service policy (Fish and Wildlife Service 2006, p. 1-2).

B. Reasons for Listing

Though wide-ranging in parts of Oregon, Washington, Idaho, and Montana, bull trout in the interior Columbia River basin presently occur in only about 45 percent of the historical range (Quigley and Arbelbide 1997, p. 1177; Rieman et al. 1997, p. 1119). Declining trends due to the combined effects of habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, angler harvest and poaching, entrainment into diversion channels and dams, and introduced nonnative species (e.g., brook trout, *Salvelinus fontinalis*) have resulted in declines in rangewide bull trout distribution and abundance (Bond 1992, p. 4; Schill 1992, p. 40; Thomas 1992, p. 9-12; Ziller 1992, p. 28; Rieman and McIntyre 1993, p. 1-18; Newton and Pribyl 1994, p. 2, 4, 8-9; Idaho Department of Fish and Game in litt. 1995, p. 1-3). Several local extirpations have been reported, beginning in the 1950s (Rode 1990 p. 1; Ratliff and Howell 1992, pp. 12-14; Donald and Alger 1993, p. 245; Goetz 1994, p. 1; Newton and Pribyl 1994, p. 2; Berg and Priest 1995, p. 1-45; Light et al. 1996, p. 20-38; Buchanan and Gregory 1997, p. 120).

Land and water management activities such as dams and other diversion structures, forest management practices, livestock grazing, agriculture, road construction and maintenance, mining, and urban and rural development continue to degrade bull trout habitat and depress bull trout populations (Fish and Wildlife Service 2002, Ch. 1 p. 13).

C. Species Description

Bull trout (*Salvelinus confluentus*), member of the family Salmonidae, are char native to the Pacific Northwest and western Canada. The bull trout and the closely related Dolly Varden (*Salvelinus malma*) were not officially recognized as separate species until 1980 (Robins et al. 1980, p. 19). Bull trout historically occurred in major river drainages in the Pacific Northwest from the southern limits in the McCloud River in northern California (now extirpated), Klamath River basin of south central Oregon, and the Jarbidge River in Nevada to the headwaters of the Yukon River in the Northwest Territories, Canada (Cavender 1978, p. 165-169; Bond 1992, p. 2-3). To the west, the bull trout's current range includes Puget Sound, coastal rivers of British Columbia, Canada, and southeast Alaska (Bond 1992, p. 2-3). East of the Continental Divide bull trout are found in the headwaters of the Saskatchewan River in Alberta and the MacKenzie River system in Alberta and British Columbia (Cavender 1978, p. 165-169; Brewin and Brewin 1997, p. 209-216). Bull trout are wide-spread throughout the Columbia River basin, including its headwaters in Montana and Canada.

D. Life History

Bull trout exhibit resident and migratory life-history strategies throughout much of the current range (Rieman and McIntyre 1993, p. 2). Resident bull trout complete their entire life cycle in the streams where they spawn and rear. Migratory bull trout spawn and rear in streams for one to four years before migrating to either a lake (adfluvial), river (fluvial), or, in certain coastal areas, to saltwater (anadromous) where they reach maturity (Fraley and Shepard 1989, p. 1; Goetz 1989, p. 15-16). Resident and migratory forms often occur together and it is suspected that individual bull trout may give rise to offspring exhibiting both resident and migratory behavior (Rieman and McIntyre 1993, p. 2).

Bull trout have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993, p. 4). Watson and Hillman (1997, p. 248) concluded that watersheds must have specific physical characteristics to provide habitat requirements for bull trout to successfully spawn and rear. It was also concluded that these characteristics are not necessarily ubiquitous throughout these watersheds resulting in patchy distributions even in pristine habitats.

Bull trout are found primarily in colder streams, although individual fish are migratory in larger, warmer river systems throughout the range (Fraley and Shepard 1989, p. 135-137; Rieman and McIntyre 1993, p. 2, 1995, p. 288; Buchanan and Gregory 1999, p. 121-122; Rieman et al. 1997, p. 1114). Water temperature above 15°C (59°F) is believed to limit bull trout distribution, which may partially explain the patchy distribution within a watershed (Fraley and Shepard 1989, p. 133; Rieman and McIntyre 1995, p. 255-296). Spawning areas are often associated with cold-water springs, groundwater infiltration, and the coldest streams in a given watershed (Pratt 1992, p. 6; Rieman and McIntyre 1993, p. 7; Rieman et al. 1997, p. 1117). Goetz (1989, p. 22, 24) suggested optimum water temperatures for rearing of less than 10°C (50°F) and optimum water temperatures for egg incubation of 2 to 4°C (35 to 39°F).

All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders, and pools (Goetz 1989, p. 22-25; Pratt 1992, p. 6; Thomas 1992, p. 4-5; Rich 1996, p. 35-38; Sexauer and James 1997, p. 367-369; Watson and Hillman 1997, p. 247-249). Jakober (1995, p. 42) observed bull trout overwintering in deep beaver ponds or pools containing large woody debris in the Bitterroot River drainage, Montana, and suggested that suitable winter habitat may be more restrictive than summer habitat. Bull trout prefer relatively stable channel and water flow conditions (Rieman and McIntyre 1993, p. 6). Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover (Sexauer and James 1997, p. 368-369).

The size and age of bull trout at maturity depend upon life-history strategy. Growth of resident fish is generally slower than migratory fish; resident fish tend to be smaller at maturity and less fecund (Goetz 1989, p. 15). Bull trout normally reach sexual maturity in four to seven years and live as long as 12 years. Bull trout are iteroparous (they spawn more than once in a lifetime), and both repeat- and alternate-year spawning has been reported, although repeat-spawning frequency and post-spawning mortality are not well documented (Leathe and Graham 1982, p. 95; Fraley and Shepard 1989, p. 135; Pratt 1992, p. 8; Rieman and McIntyre 1996, p. 133).

Bull trout typically spawn from August to November during periods of decreasing water temperatures. Migratory bull trout frequently begin spawning migrations as early as April, and have been known to move upstream as far as 250 kilometers (km) (155 miles (mi)) to spawning grounds (Fraley and Shepard 1989, p. 135). Depending on water temperature, incubation is normally 100 to 145 days (Pratt 1992, p. 1) and, after hatching, juveniles remain in the substrate. Time from egg deposition to emergence may exceed 200 days. Fry normally emerge from early April through May depending upon water temperatures and increasing stream flows (Pratt 1992, p. 1).

The iteroparous reproductive system of bull trout has important repercussions for the management of this species. Bull trout require two-way passage up and downstream, not only for repeat spawning, but also for foraging. Most fish ladders, however, were designed specifically for anadromous semelparous (fishes that spawn once and then die, and therefore

require only one-way passage upstream) salmonids. Therefore even dams or other barriers with fish passage facilities may be a factor in isolating bull trout populations if they do not provide a downstream passage route.

Bull trout are opportunistic feeders with food habits primarily a function of size and life-history strategy. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macro-zooplankton and small fish (Boag 1987, p. 58; Goetz 1989, p. 33-34; Donald and Alger 1993, p. 239-243). Adult migratory bull trout are primarily piscivores, known to feed on various fish species (Fraley and Shepard 1989, p. 135; Donald and Alger 1993, p. 242).

E. Population Dynamics and Viability

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002, Ch. 1, p. 47-48) defined core areas as groups of partially isolated local populations of bull trout with some degree of gene flow occurring between them. Based on this definition, core areas can be considered metapopulations. A metapopulation is an interacting network of local populations with varying frequencies of migration and gene flow among them (Meefe and Carroll 1994, p. 188). In theory, bull trout metapopulations (core areas) can be composed of two or more local populations, but Rieman and Allendorf (2001, p. 763) suggest that for a bull trout metapopulation to function effectively, a minimum 10 local populations are required. Bull trout core areas with fewer than five local populations are at increased risk of local extirpation, core areas with between five and 10 local populations are at intermediate risk, and core areas with more than 10 interconnected local populations are at diminished risk (Fish and Wildlife Service 2002, Ch. 1 p. 50-51).

The presence of a sufficient number of adult spawners is necessary to ensure persistence of bull trout populations. In order to avoid inbreeding depression, it is estimated that a minimum of 100 spawners is required. Inbreeding can result in increased homozygosity of deleterious recessive alleles which can in turn reduce individual fitness and population viability (Whitesel et al. 2004, p. 36). For persistence in the longer term, adult spawning fish are required in sufficient numbers to reduce the deleterious effects of genetic drift and maintain genetic variation. For bull trout, Rieman and Allendorf (2001, p. 762) estimate that approximately 1,000 spawning adults within any bull trout population are necessary for maintaining genetic variation indefinitely. Many local bull trout populations individually do not support 1,000 spawners, but this threshold may be met by the presence of smaller interconnected local populations within a core area.

For bull trout populations to remain viable (and recover), natural productivity should be sufficient for the populations to replace themselves from generation to generation. A population that consistently fails to replace itself is at an increased risk of extinction. Since estimates of population size are rarely available, the productivity or population growth rate is usually estimated from temporal trends in indices of abundance at a particular life stage. For example, redd counts are often used as an indicator of a spawning adult population. The direction and magnitude of a trend in an index can be used as a surrogate for growth rate.

Survival of bull trout populations is also dependent upon connectivity among local populations. Although bull trout are widely distributed over a large geographic area, they exhibit a patchy distribution even in pristine habitats (Rieman and McIntyre 1993, p. 7). Increased habitat fragmentation reduces the amount of available habitat and increases isolation from other populations of the same species (Saunders et al. 1991, p. 22). Burkey (1989, p. 76) concluded

that when species are isolated by fragmented habitats, low rates of population growth are typical in local populations and their probability of extinction is directly related to the degree of isolation and fragmentation. Without sufficient immigration, growth of local populations may be low and probability of extinction high. Migrations also facilitate gene flow among local populations because individuals from different local populations interbreed when some stray and return to nonnatal streams. Local populations that are extirpated by catastrophic events may also become reestablished in this manner.

In summary, based on the works of Rieman and McIntyre (1993, pp. 9-15) and Rieman and Allendorf (2001, p 756-763), the draft bull trout Recovery Plan identified four elements to consider when assessing long-term viability (extinction risk) of bull trout populations: (1) number of local populations, (2) adult abundance (defined as the number of spawning fish present in a core area in a given year); (3) productivity, or the reproductive rate of the population; and (4) connectivity (as represented by the migratory life history form).

F. Status and Distribution

As noted above, in recognition of available scientific information relating to their uniqueness and significance, five population segments¹ of the coterminous United States population of the bull trout are considered essential to the survival and recovery of this species and are identified as: (1) Jarbidge River, (2) Klamath River, (3) Coastal-Puget Sound, (4) St. Mary-Belly River, and (5) Columbia River. Each of these segments is necessary to maintain the bull trout's distribution, as well as its genetic and phenotypic diversity, all of which are important to ensure the species' resilience to changing environmental conditions.

A summary of the current status and conservation needs of the bull trout within these units is provided below. A comprehensive discussion of these topics is found in the draft bull trout Recovery Plan (Fish and Wildlife Service 2002, 2004a,b).

Central to the survival and recovery of the bull trout is the maintenance of viable core areas (Fish and Wildlife Service 2002; Ch. 1, p. 54). A core area is defined as a geographic area occupied by one or more local bull trout populations that overlap in their use of rearing, foraging, migratory, and overwintering habitat, and in some cases their use of spawning habitat. Each of the population segments listed above consists of one or more core areas. One hundred and twenty one core areas are recognized across the United States range of the bull trout (Fish and Wildlife Service 2005, p. 9).

A core area assessment conducted by the Service for the five-year bull trout status review determined that of the 121 core areas comprising the coterminous listing, 43 are at high risk of extirpation, 44 are at risk, 28 are at potential risk, four are at low risk and two are of unknown status (Fish and Wildlife Service 2005, p. 9).

¹ "Population segment" will be used in this Opinion rather than "interim recovery unit" to avoid confusion with recovery units identified in the draft bull trout Recovery Plans.

1. Jarbidge River

This population segment currently contains a single core area with six local populations. Less than 500 resident and migratory adult bull trout, representing about 50 to 125 spawners, are estimated to occur within the core area. The current condition of the bull trout in this segment is attributed to the effects of livestock grazing, roads, angler harvest, timber harvest, and the introduction of nonnative fishes (Fish and Wildlife Service 2004a, p. iii). The draft bull trout recovery plan (Fish and Wildlife Service 2004a) identifies the following conservation needs for this segment: (1) maintain the current distribution of the bull trout within the core area, (2) maintain stable or increasing trends in abundance of both resident and migratory bull trout in the core area, (3) restore and maintain suitable habitat conditions for all life history stages and forms, and (4) conserve genetic diversity and increase natural opportunities for genetic exchange between resident and migratory forms of the bull trout. An estimated 270 to 1,000 spawning fish per year are needed to provide for the persistence and viability of the core area and to support both resident and migratory adult bull trout (Fish and Wildlife Service 2004a, p. 62-63). Currently this core area is at high risk of extirpation (Fish and Wildlife Service 2005, p. 9).

2. Klamath River

This population segment currently contains three core areas and 12 local populations. The current abundance, distribution, and range of the bull trout in the Klamath River Basin are greatly reduced from historical levels due to habitat loss and degradation caused by reduced water quality, timber harvest, livestock grazing, water diversions, roads, and the introduction of nonnative fishes (Fish and Wildlife Service 2002). Bull trout populations in this unit face a high risk of extirpation (Fish and Wildlife Service 2002; Ch. 2, p. iv). The draft bull trout recovery plan (Fish and Wildlife Service 2002; Ch. 2, p. v) identifies the following conservation needs for this unit: (1) maintain the current distribution of the bull trout and restore distribution in previously occupied areas, (2) maintain stable or increasing trends in bull trout abundance, (3) restore and maintain suitable habitat conditions for all life history stages and strategies, and (4) conserve genetic diversity and provide the opportunity for genetic exchange among appropriate core area populations. Eight to 15 new local populations and an increase in population size from about 3,250 adults currently to 8,250 adults are needed to provide for the persistence and viability of the three core areas (Fish and Wildlife Service 2002; Ch. 2, p. vi).

3. Coastal-Puget Sound

Bull trout in the Coastal-Puget Sound population segment exhibit anadromous, adfluvial, fluvial, and resident life history patterns. The anadromous life history form is unique to this unit. This population segment currently contains 14 core areas and 67 local populations (Fish and Wildlife Service 2004b; Vol. 1, p. iv; Vol. 2, p. iii-iv). Bull trout are distributed throughout most of the large rivers and associated tributary systems within this unit. With limited exceptions, bull trout continue to be present in nearly all major watersheds where they likely occurred historically within this unit. Generally, bull trout distribution has contracted and abundance has declined especially in the southeastern part of the unit. The current condition of the bull trout in this population segment is attributed to the adverse effects of dams, forest management practices (e.g., timber harvest and associated road building activities), agricultural practices (e.g., diking, water control structures, draining of wetlands, channelization, and the removal of riparian vegetation), livestock grazing, roads, mining, urbanization, angler harvest, and the introduction

of nonnative species. The draft bull trout recovery plan (Fish and Wildlife Service 2004b; Vol. 1, p. ix-x) identifies the following conservation needs for this unit: (1) maintain or expand the current distribution of bull trout within existing core areas, (2) increase bull trout abundance to about 16,500 adults across all core areas, and (3) maintain or increase connectivity between local populations within each core area.

4. St. Mary-Belly River

This population segment currently contains six core areas and nine local populations (Fish and Wildlife Service 2002; Ch. 25, p. v). Currently, bull trout are widely distributed in the St. Mary River drainage and occur in nearly all of the waters that were inhabited historically. Bull trout are found only in a 1.2-mile reach of the North Fork Belly River within the United States. Redd count surveys of the North Fork Belly River documented an increase from 27 redds in 1995 to 119 redds in 1999. This increase was attributed primarily to protection from angler harvest (Fish and Wildlife Service 2002; Ch. 25, p. 37). The current condition of the bull trout in this population segment is primarily attributed to the effects of dams, water diversions, roads, mining, and the introduction of native fishes (Fish and Wildlife Service 2002; Ch. 25, p. vi). The draft bull trout recovery plan (Fish and Wildlife Service 2002; Ch. 25, p. v-ix) identifies the following conservation needs for this unit: (1) maintain the current distribution of the bull trout and restore distribution in previously occupied areas, (2) maintain stable or increasing trends in bull trout abundance, (3) maintain and restore suitable habitat conditions for all life history stages and forms, (4) conserve genetic diversity and provide the opportunity for genetic exchange, and (5) establish good working relations with Canadian interests because local bull trout populations in this unit are comprised mostly of migratory fish whose habitat is mainly in Canada.

5. Columbia River

The Columbia River population segment includes bull trout residing in portions of Oregon, Washington, Idaho, and Montana. Bull trout are estimated to have occupied about 60 percent of the Columbia River Basin, and presently occur in 45 percent of the estimated historical range (Quigley and Arbelbide 1997, p. 1177). This population segment currently contains 97 core areas and 527 local populations. About 65 percent of these core areas and local populations occur in Idaho and northwestern Montana.

The condition of the bull trout within these core areas varies from poor to good, but generally all have been subject to the combined effects of habitat degradation, fragmentation and alterations associated with one or more of the following activities: dewatering, road construction and maintenance, mining and grazing, the blockage of migratory corridors by dams or other diversion structures, poor water quality, incidental angler harvest, entrainment into diversion channels, and introduced nonnative species.

The Service has determined that of the total 97 core areas in this population segment, 38 are at high risk of extirpation, 35 are at risk, 20 are at potential risk, two are at low risk, and two are at unknown risk (Fish and Wildlife Service 2005, p. 1-94).

The draft bull trout recovery plan (Fish and Wildlife Service 2002; Ch. 1, p. v) identifies the following conservation needs for this population segment: (1) maintain or expand the current

distribution of the bull trout within core areas, (2) maintain stable or increasing trends in bull trout abundance, (3) maintain and restore suitable habitat conditions for all bull trout life history stages and strategies, and (4) conserve genetic diversity and provide opportunities for genetic exchange.

6. Columbia River Recovery/Management Units

Achieving recovery goals within each management unit is critical to recovering the Columbia River population segment. Recovering bull trout in each management unit would maintain the overall distribution of bull trout in their native range. Individual core areas are the foundation of management units and conserving core areas and their habitats within management units preserves the genotypic and phenotypic diversity that will allow bull trout access to diverse habitats and reduce the risk of extinction from stochastic events. The continued survival and recovery of each individual core area is critical to the persistence of management units and their role in the recovery of a population segment (Fish and Wildlife Service 2002; Ch. 1, p. 54).

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002; Ch. 1, p. 2) identified 22 recovery units within the Columbia River population segment. These units are now referred to as management units. Management units are groupings of bull trout with historical or current gene flow within them and were designated to place the scope of bull trout recovery on smaller spatial scales than the larger population segments. Of these 22 management units, the Clearwater River unit encompasses the project action area.

a. Snake River Geographical Area

Bull trout occupy portions of 14 major tributaries in the Snake River basin of Idaho, Oregon, and Washington. The Service identified 34 bull trout subpopulations in the Snake River basin. Downstream of Hell's Canyon Dam, major tributaries that support bull trout include (number of subpopulations)--Tucannon River (2), Clearwater River (3), Asotin Creek (2), Grande Ronde River (1), Imnaha River (4), and Salmon River (2). Upstream of Hells Canyon Dam, major tributaries that support bull trout include--Pine Creek (4), Powder River (3), Malheur River (2), Payette River (4), Weiser River (2), and Boise River (2). Although bull trout distribution upstream of Hell's Canyon Dam is limited primarily to the basin downstream of Shoshone Falls in southern Idaho, three geographically isolated bull trout subpopulations occur upstream of Shoshone Falls in the Little Lost River drainage. Bull trout subpopulations upstream of Hell's Canyon Dam are generally low in abundance, fragmented, and isolated. Numerous impassable dams and large expanses of unsuitable habitat have isolated subpopulations. Isolation is most prominent upstream of Hell's Canyon Dam in southwest Idaho and southeast Oregon.

The basin downstream of Hell's Canyon Dam is relatively intact, and connectivity among bull trout subpopulations may still occur there. The species occupies large areas of contiguous habitat in the Snake River basin downstream of Hell's Canyon Dam, such as in the Clearwater River and Salmon River basins. High numbers of bull trout have been observed in the Tucannon River, Imnaha River, Clearwater River, Salmon River, and Malheur River subpopulations, however, trends in abundance are largely unknown or declining.

b. South Fork Salmon River Core Area

Both resident and fluvial populations of bull trout were documented in the mainstem South Fork Salmon River and in the 18 tributaries in the 1980's (Fish and Wildlife Service 2002, p. 28). Hogen (Assessment, p. 13) documented spawning in Quartz, Profile, Tamarak, and Sugar Creeks and their tributaries from August 28 to September 15 (2001). Overwintering fluvial bull trout were observed in the lower South Fork Salmon River from the Sheep Creek confluence downstream to the mouth of the South Fork Salmon River. Bull trout also overwintered in the mainstem Salmon River from Elkhorn Creek confluence upstream to Big Mallard Creek (Assessment, p 13). Studies associated with steelhead and salmon spawning reported bull trout in Nethker, Threemile, and Willow Creeks within Lake Creek local populations.

G. Consulted-on Effects Rangewide

Consulted-on effects are those effects that have been analyzed through section 7 consultation as reported in a biological opinion. These effects are an important component of objectively characterizing the current condition of the species. To assess consulted-on effects to bull trout we analyzed all of the biological opinions received by the Region 1 and Region 6 Service Offices, from the time of listing until August 2003; this summed to 137 biological opinions. Of these, 124 biological opinions (91 percent) applied to activities affecting bull trout in the Columbia Basin population segment, 12 biological opinions (nine percent) applied to activities affecting bull trout in the Coastal-Puget Sound population segment, seven biological opinions (five percent) applied to activities affecting bull trout in the Klamath Basin population segment, and one biological opinion (< one percent) applied to activities affecting the Jarbidge and St. Mary-Belly population segments (Note: these percentages do not add to 100 because several biological opinions applied to more than one population segment). The geographic scale of these consultations varied from individual actions (e.g., construction of a bridge or pipeline) within one basin to multiple-project actions occurring across several basins.

Our analysis showed that we consulted on a wide array of actions which had varying levels of effect. Many of the actions resulted in only short-term adverse effects – some with long-term beneficial effects. Some of the actions resulted in long-term adverse effects. No actions that have undergone consultation were found to appreciably reduce the likelihood of survival and recovery of the bull trout. Furthermore, no actions that have undergone consultation were anticipated to result in the loss of local populations of bull trout.

H. Conservation Needs

Recovery for bull trout will entail reducing threats to the long-term persistence of populations and their habitats, ensuring the security of multiple interacting groups of bull trout, and providing habitat conditions and access to them that allow for the expression of various life-history forms (Fish and Wildlife Service 2002; Ch. 1, p. 43). The draft Bull Trout Recovery Plan identifies the following tasks needed for achieving recovery: (1) protect, restore, and maintain suitable habitat conditions for bull trout; (2) prevent and reduce negative effects of nonnative fishes, such as brook trout, and other nonnative taxa on bull trout; (3) establish fisheries management goals and objectives compatible with bull trout recovery; (4) characterize, conserve, and monitor genetic diversity and gene flow among local populations of bull trout; (5) conduct research and

monitoring to implement and evaluate bull trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery tasks; (6) use all available conservation programs and regulations to protect and conserve bull trout and bull trout habitats; (7) assess the implementation of bull trout recovery by management units; and (8) revise management unit plans based on evaluations.

The conservation needs of the bull trout are often expressed as the four Cs: cold, clean, complex, and connected. Cold stream temperatures, clean water quality that is relatively free of sediment and contaminants, complex channel characteristics (including abundant large wood and undercut banks), and large patches of such habitat that are well connected by unobstructed migratory pathways are all needed to promote conservation of bull trout at multiple scales ranging from the coterminous to local populations. The recovery planning process for the bull trout (Service 2002) has also identified the following conservation needs for the bull trout: (1) maintain and restore multiple, interconnected populations in diverse habitats across the range of each interim recovery unit; (2) preserve the diversity of life-history strategies; (3) maintain genetic and phenotypic diversity across the range of each interim recovery unit; and (4) establish a positive population trend. Recently, it has also been recognized that bull trout populations need to be protected from catastrophic fires across the range of each interim recovery unit.

Another threat now facing bull trout is warming temperature regimes associated with global climate change. Because air temperature affects water temperature, species at the southern margin of their range that are associated with cold water patches, such as bull trout, may become restricted to smaller, more disjunct patches or become extirpated as the climate warms (Rieman et al. 2007, p. 1560). Rieman et al. (2007, pp. 1558, 1562) concluded that climate is a primary determining factor in bull trout distribution. Some populations at high risk already, such as the Jarbidge, may require “aggressive measures in habitat conservation or restoration” to persist (Rieman et al. 2007, p. 1560).

I. Critical Habitat

The Service issued a final rule designating critical habitat for bull trout range-wide on September 26, 2005 (70 FR 56212). The designation includes 4,813 miles of stream or shoreline and 143,218 acres of lake or reservoir. We designated areas as critical habitat that (1) have documented bull trout occupancy within the last 20 years, (2) contain features essential to the conservation of the bull trout, (3) are in need of special management, and (4) were not excluded under section 4(b)(2) of the Act. The Final Rule excluded from designation those federally managed areas covered under PACFISH, INFISH, the Interior Columbia Basin Ecosystem Management Project, and the Northwest Forest Plan Aquatic Conservation Strategy. The Service determined that these strategies provide a level of conservation and adequate protection and special management for the primary constituent elements of critical habitat at least comparable to that achieved by designating critical habitat. Areas managed under these strategies do not meet the statutory definition of critical habitat (i.e., areas requiring special management considerations) and were therefore excluded. The excluded areas include much of the proposed critical habitat in Idaho: the final rule only designates 294 miles of stream/shoreline and 50,627 acres of reservoirs or lakes. There is no designated critical habitat for bull trout within the action area.

III. ENVIRONMENTAL BASELINE

The environmental baseline is defined as the current habitat condition including the past and present impacts on bull trout of all Federal, state or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impacts of state or private actions that are contemporaneous with the consultation in process.

A. Status of the Species in the Action Area

Bull trout use of the Secesh analysis area has been well studied. Seasonal movements and life history strategies of 71 adult radio-tagged bull trout were studied in the Secesh River drainage during 2003 and 2004 (Assessment, p. 13). As a result of this study, spawning and overwintering areas were located for adult fish. Migrations into two spawning tributaries (Pete Creek and Threemile Creek, approximately 5 and 5.2 miles upstream from the western edge of the project area, respectively) occurred during late July and early August with spawning occurring from mid-August through mid-September. Downstream postspawning migrations occurred between late August and mid-September. In 2003, nine redds were positively identified in Threemile Creek between August 24 and September 21, but no redds were identified in the South Fork of Threemile Creek. Two redds were positively identified in Pete Creek on September 1 and 5. Radio-tagged fish remained in Threemile Creek until at least September 21 and in Pete Creek until at least September 5. In 2004, two redds were positively identified in Threemile Creek on August 16. As in 2003, no redds were identified in the South Fork of Threemile Creek. Three redds were positively identified in Pete Creek between August 17 and September 1. Radio tagged fish remained in Threemile Creek until at least August 26 and in Pete Creek until at least September 3. Radio-tagged bull trout over-wintered in Loon Lake, the lower Secesh River (below Loon Creek), and the lower South Fork Salmon River (below the confluence with the Secesh River), approximately 12.2, 10.7, and 26.5 miles downstream from the eastern edge of the project area, respectively.

A bull trout monitoring protocol designed for the Secesh watershed was field tested from September 6 to 9, 2007 in the Lake Creek and Summit Creek drainages (66 reaches in 8 patches). The purpose of the protocol is to provide a scientifically valid means of determining the distribution and trends of bull trout populations throughout the watershed. The preliminary report on this assessment stated that bull trout were detected in all sampled patches (Upper Lake Creek, Willow Creek, Threemile Creek, Grouse/Sand Creek, Summit Creek, Nethker Creek, Burgdorf Creek, and Pete Creek), with the strongest bull trout populations occurring in Pete Creek and Threemile Creek. Weak bull trout populations appeared to exist in Willow Creek and upper Lake Creek, where single bull trout juveniles were captured in single reaches. These patches ranged between 0.7 and 8.9 miles upstream from the western edge of the project area and were approximately 1.62 miles downstream from the eastern edge of the project area (Assessment, p. 13).

B. Factors Affecting the Species in the Action Area

Forestry management practices, livestock grazing, transportation networks, mining and associated chemical contamination, and residential development and urbanization are major

identified threats to bull trout habitat in this core area. The magnitude of these threats is not currently known or agreed upon.

Long-term sediment monitoring by the Forest indicates that trends are improving in the sites measured. The Forest believes the rehabilitative and mitigation measures for actions in both the South Fork Salmon River and Secesh watersheds have been effective in restoring resiliency to those systems, however, stream conditions prior to land management actions have not been fully restored. Secesh Meadows, a private inholding in the Payette National Forest in the South Fork Salmon River core area, is currently being developed and this could impact local populations of bull trout. Other private inholdings along lower Johnson Creek and upper East Fork South Fork Salmon River near Stibnite could impact bull trout in these streams (Assessment, p 13).

IV. EFFECTS OF THE ACTION ON BULL TROUT

A. Direct and Indirect Effects

Direct effects are defined as those that result from the proposed action and directly or immediately impact the species or its habitat. Indirect effects are those that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur (50 CFR §402). From this action, we anticipate that adverse effects will only arise from blasting activities. As described below, it is our opinion, that all other mechanisms of effects will be insignificant.

1. Sediment and Petroleum-related Effects

The Service expects that sediment delivery to the Secesh River resulting from road construction, fill removal, creation of larger cut slopes, and culvert extension and replacement is a potential effect of the Project on the RCAs and water quality. Potential exposure to petroleum products through leaks or spills of fuel and oil and exposure to magnesium-chloride dust abatement chemicals ($MgCl_2$) could also affect water quality. Some short-term increases in suspended sediment and turbidity could result.

In small river systems, and depending upon concentration and duration of exposure, suspended sediment may directly affect bull trout physiological condition and behavior (Newcombe and Jensen 1996, p. 693-715, Bash et al. 2001, p. 2). Newcombe and Jensen (1996, p. 694, 698) predict that sublethal adverse effects are expected for juvenile and adult salmonids at suspended sediment concentrations as low as 55 milligrams/liter at exposure times of three hours. This level of exposure may produce short-term reductions in feeding rates and feeding success, and minor physiological stress. Compared with other salmonids, bull trout are more sensitive to sediment and require the lowest suspended sediment levels (Bash et al. 2001, p. 24). The Service does not expect this project to result in adverse or long-term effects from the above mentioned mechanisms, however. The Secesh River is a large system and nodal habitat for bull trout. Given the extent of the proposed sediment-generating activities, it is unlikely that any of them would result in measurable effects to bull trout. Furthermore, all vegetation removal proposed will occur on the upland side of the road and remain in the RCA.

Fuel or oil leaks and spills are a potential risk resulting from use, refueling, and maintenance of mechanized equipment during construction activities. Should measurable quantities of fuel or

other petroleum products enter live water, they could affect water quality and invertebrates and would directly affect bull trout if present. Fuels and other petroleum products can directly poison salmonids and their aquatic invertebrate food source. The potential for fuel and other petroleum products entering the Secesh River at measurable levels and reaching and affecting fish habitat and causing fish mortality would be reduced to negligible levels through the implementation of fuel and petroleum-related mitigation (see mitigation measures in the Assessment). This mitigation would keep fuels as far as possible from live water by prohibiting storage of fuel and minimizing refueling in the RCAs, and would reduce the likelihood of uncontained spills by requiring implementation of a Spill Prevention and Containment Plan (Assessment). Furthermore, effects from this mechanism are difficult to predict and are not part of the proposed action.

2. Blasting Effects

The proposed action may require blasting to remove boulders and bedrock occurring in the expanded alignment. Blasting has the potential to affect fish species directly and indirectly. Blasting is only proposed in road segments 1 and 2. In both segments, overburden materials would be removed with mechanical equipment and blasting would only be employed in those areas where mechanical removal is impractical. Total volume of material to be removed via blasting is unknown pending further geotechnical evaluation of the sites but would not exceed the maximums presented above in the Proposed Action section.

Hydroacoustic pressure and particle velocity is measured in decibels (dB). A decibel is defined as ten times the base-ten logarithm of the ratio between squared test amplitude (pressure or particle velocity) and corresponding squared reference amplitude. When the amplitudes describe the pressure of acoustic waves, the squared amplitudes vary in direct proportion to the power transmitted by those waves. Thus, the decibel measures the difference, in orders of magnitude ($\times 10$), between a test power and a reference power: 10 dB means ten times the power, 20 dB means one hundred times the power, 30 dB means one thousand times the power, and so on. Because the decibel is always a relative measure, any absolute value expressed in decibels is meaningless without an accompanying reference. In describing underwater sound pressure, the reference amplitude is usually 1 micro-pascal (μPa , or 10^{-6} pascals). The SI (International System of Units; metric) measure of pressure amplitude is the pascal (Pa), approximately equivalent to 0.000145 pounds per square inch (Burgess and Blackwell 2003, p. 22).

Sudden pressure changes can cause gas-filled spaces in the body, such as the swim bladder, to rapidly expand and/or contract resulting in the tearing and rupturing of surrounding tissues. Such exposure can result in internal hemorrhaging and loss of organ functions resulting in mortality. Non-fatal physiological injury can include reduced hearing sensitivity in some hearing specialist species, loss of hydrostatic control, impaired mobility, and impaired vision (Wright and Hopky 1998, p. 3-4 and Keevin and Hempen 1997, p. 6-12). Physostomus fishes, such as salmonids, regulate the air in their swim bladders through a direct connection to the esophagus. Salmonids acclimate their swim bladders by gulping air at the surface, and as they swim deeper the swim bladder becomes compressed. When exposed to a sudden positive pressure, or overpressure, the swim bladder compresses further. When exposed to a sudden negative pressure, or under pressure, the swim bladder may expand beyond its original volume at depth but may not suffer or injure any other organs because it has some room to expand. Physostomus fishes acclimated to the surface atmospheric pressure may suffer less injury or

mortality the deeper they are in the water column, whereas those acclimated to deeper water pressure may suffer more injury in shallow areas (Assessment, p. 35).

Short of direct injury or mortality, hydroacoustic pressure can result in limited duration behavioral effects resulting from a fish species' startle response. The startle response is observed as an involuntary reaction to an introduced noise disruption that results in a change in an individual's behavior. Such changes in behavior can result in indirect effects through alteration in feeding or breeding success, decreased predator avoidance, and displacement into less suitable habitat. These effects can result in injury or death, but more commonly constitute potential loss of species vigor (Hastings and Popper 2005, p.19). As such, they are generally viewed as a form of harassment-based impacts.

Given the close proximity of the project area to the aquatic environment, the proposed action will utilize the 0.5-pound charge recommendation for a 30-foot buffer; this approach should be protective of salmonids from injury or mortality, given a threshold for hydroacoustic behavioral effects on salmonids at 150 dB_(RMS) (Assessment, p. 35-36). It is not likely that the buffer distance is sufficient to reduce hydroacoustic levels below this harassment threshold. To further minimize potential harassment effects on salmonids, the following design features and BMPs will be employed:

- Project timing will occur during seasonal low abundance of species of concern.
- Mechanical excavation of overburden will be completed prior to blasting to minimize the extent of blasting required.
- Distance for blasting in the project area would be a minimum of 30 feet from aquatic resource.
- Size of the charge for the project would also be consistent with guidance for a 30- foot buffer distance.
- Detonation sequences would employ a delay where each blast is subdivided into many smaller blasts, separated by a few milliseconds (minimum of 8 milliseconds). This would reduce the likelihood of constructive interference increasing the amplitude of the blast (i.e. it would reduce the amplitude of the blast).
- Charge locations would be drilled into the rock, resulting in directivity of the force away from aquatic resources, which may better attenuate hydroacoustic pressure levels instream.
- Use of heavy blasting mats to cover the charge will be employed to reduce the blast energy and contain any flying debris.
- A blast curtain will be employed to contain flying debris.

Given the small quantities proposed, blasting is not anticipated to take more than several days to complete. Given the above BMPs and the limited scope of blasting, no direct injury or mortality of protected fish resources is anticipated from this action. However, there is insufficient

information (primarily geotechnical and hydroacoustic) to accurately model whether the proposed avoidance and minimization measures can reduce sound pressure levels below the 150 dB_(RMS) harassment threshold. As such, it is likely that blasting will result in short-term behavioral effects on bull trout, which may decrease individual's vigor or possibly increase the chance of predation. Such effects should be very brief in duration, lasting no more than several hours over the course of two or three days construction.

B. Effects of Interrelated or Interdependent Actions

The Service did not identify any interrelated or interdependent actions associated with the road improvement actions.

V. CUMULATIVE EFFECTS

Cumulative effects are the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Many of the categories of on-going activities with potential effects to bull trout and bull trout habitat were identified in the Status of the Species section of this Opinion. These activities include timber harvest, mining, road building, and grazing, all of which are occurring in the action area.

The Service is not aware of any specific cumulative effects that are reasonably certain to occur and would have a measurable effect on bull trout in the action area.

VI. CONCLUSION

The Service has reviewed the current status of bull trout, the environmental baseline for the action area, the effects of the proposed Warren Wagon Road Improvement Project, and the cumulative effects. The Service concludes that direct and indirect effects to bull trout will be limited to sublethal harassment of an unknown (presumably very low) number of adult and subadult bull trout during blasting activities. No bull trout spawning areas are expected to be affected by the Project.

While adverse effects may impact individual bull trout, it is the Service's biological opinion that the Project will not adversely impact any local populations of bull trout in the action area, or the South Fork Salmon River core area, the Salmon River Management Unit, or the Columbia River population segment. We conclude that the proposed actions will not jeopardize the coterminous population of bull trout.

VII. INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat

modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The Forest has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest fails to assume and implement the terms and conditions the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

A. Amount or Extent of Take

Blasting in Segments 1 and 2 of the proposed project is expected to result in take of bull trout in the form of harassment from hydroacoustic pressure. We expect that the amount of take that will occur is low. Take will be confined to any adult and subadult bull trout in the Secech River located within 200 feet downstream of all blasting activities. We expect that no lethal take will occur and that no eggs, fry, or juvenile bull trout will be taken.

B. Effect of the Take

Given that no lethal take is expected to occur and that very few bull trout will be harassed, the effect of the take is considered minimal. No spawning fish, eggs, fry, or young will be taken. Therefore, we conclude that any adverse effects and associated take will have little impact on the Secesh potential local population and will have no impact on the South Fork Salmon River core area, the South Fork Salmon River Management Unit, or the Columbia River population segment.

C. Reasonable and Prudent Measures/Terms and Conditions

The Service does not believe that any reasonable and prudent measures or terms and conditions are necessary for the proposed action because the Forest has included extensive mitigation measures up front to reduce take. Additional measures would not further reduce the take expected to occur.

D. Reporting Requirements

The Forest shall monitor any take that occurs during Project implementation and report this to the Service.

VIII. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act requires Federal Agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends that the Forest implement the following conservation measures.

1. Because a third party is implementing the proposed action, be sure that the Forest has personnel on site at all times and that the action is implemented as proposed.
2. Continue to survey and monitor bull trout populations and habitat in the action area to gather baseline and population trend information.
3. Keep the Service informed of actions that minimize or avoid adverse effects or that benefit listed species or their habitats. The Service requests notification on implementation of any conservation recommendations.

IX. REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

LITERATURE CITED

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